REMARKS

Claims 1-5 and 7-16 are now pending in the application, with Claims 1 and 15 being independent. Claim 6 has been cancelled without prejudice or disclaimer of its subject matter. Claims 1, 3, 5, 7, 8, 13, 15 and 16 have been amended herein.

In view of the foregoing amendments and following remarks, Applicants respectfully request reconsideration and withdrawal of the rejections set forth in the above-identified Office Action.

Claims 1-14 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Without conceding the propriety of the rejection, Applicants have reworded some of the language questioned by the Examiner. These changes are not believed to affect the scope of the claims, but rather improve their form. As to the feature of "synthesizing a synthetic parallax image", and the phrase "different view points", it is respectfully submitted that this terminology would be understood by one having ordinary skill in the art. Although the terms in question may be broader than what the Examiner may desire, breadth is not to be equated with indefiniteness. Note MPEP 2173.04. As to "optical reduced distance," such terminology is well-known to those skilled in the art. In view of the foregoing, reconsideration and withdrawal of the § 112 rejection are requested.

Claims 1-5, 7, 11, 12 and 14-16 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,703,717 (Ezra et al.) in view of U.S. Patent No. 5,663,831 (Mashitani et al.). Claims 6, 13 and 16 were rejected in further view of U.S. Patent No. 6,061,179 (Inoguchi et al.). These rejections are respectfully traversed.

As recited in independent Claim 1, the present invention relates to a stereoscopic image display method for permitting an observer to stereoscopically observe

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image information displayed on an image display element. The method includes the steps of dividing each of parallax images, corresponding to a plurality of different view points, into predetermined strip images, synthesizing a synthetic parallax image from the stripe images and guiding display light, from stripe images corresponding to one view point in the synthetic parallax image on the image display element displaying the synthetic parallax image, to a mask member having a mask pattern with predetermined openings and shields by a second optical system placed in front of the image display element. The method further includes the step of converging display light passing through the openings of the mask member to a position corresponding to the view point on an observation surface a predetermined distance apart, by a first optical system. The second optical system has predetermined periodic structure in each of horizontal and vertical directions in order from the light incident side, and an elementary optical element forming one period in the horizontal and vertical directions has optical action in the horizontal direction and optical action in the vertical direction different from each other.

As recited in independent Claim 15, the present invention relates to a stereoscopic image display method using an image display element and a mask member having a mask pattern with predetermined openings and shield. The method includes the steps of directing image display light from the image display element and effecting the directing of the image display light with a first optical system and a second optical system placed before and after the mask pattern. The second optical system has predetermined periodic structure in each of horizontal and vertical directions in order from the light incident side, and an elementary optical element forming one period in the horizontal and

vertical directions has optical action in the horizontal direction and optical action in the vertical direction different from each other.

With the above methods, only predetermined parallax light can be passed through a mask pattern having predetermined openings and shields, by combining a horizontal lenticular lens and a vertical lenticular lens.

Ezra et al. relates to a three-dimensional projection display apparatus that can produce an autostereoscopic image. However, as recognized by the Examiner, Ezra et al. does not disclose or suggest a mask pattern of openings and shields. Applicants submit that such a feature is essential to the present invention. Nor does Ezra et al. disclose or suggest the newly-recited features of the independent claims.

Mashitani et al. relates to a three-dimensional display including a diffusing plate arranged on a surface on which an image is formed and a parallax barrier having slits in the shape of vertical stripes. As understood by Applicants, the image itself of the two view points is imaged on different positions on diffusion surface 3 by a lenticular lens. However, one of ordinary skill in the art would not be motivated to combine the teachings of Mashitani et al. with Ezra et al. Any such combination is based on impermissible hindsight.

Inoguchi et al. was cited by the Examiner for teaching a lenticular lens array combination. However, Inoguchi et al. is not believed to remedy the deficiencies of the citations noted above with respect to the independent claims.

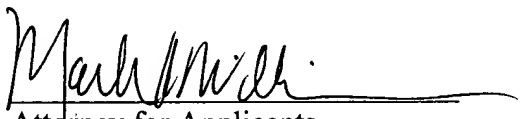
Thus, independent Claims 1 and 15 are patentable over the citations of record. Reconsideration and withdrawal of the § 103 rejections are requested.

For the foregoing reasons, Applicants respectfully submit that the present invention is patentably defined by independent Claims 1 and 15. Dependent Claims 2-5, 7-14 and 16 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of the dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action, and an early Notice of Allowance are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our new address given below.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

1. (Amended) A stereoscopic image display method for permitting an observer to stereoscopically observe image information displayed on an image display element, comprising the steps of:

[by] dividing each of parallax images, corresponding to a plurality of different view points, into predetermined strip images[,];

synthesizing a synthetic parallax image from the stripe images[,];

guiding display light, from stripe images corresponding to one view point in the synthetic parallax image on the image display element displaying the synthetic parallax image, to a mask member having a mask pattern with predetermined openings and shields by a second optical system placed in front of the image display element[,]; and

converging display light passing through the openings of the mask member to a position corresponding to the view point on an observation surface a predetermined distance apart, by a first optical system,

wherein the second optical system has predetermined periodic structure in each of horizontal and vertical directions in order from the light incident side, and an elementary optical element forming one period in the horizontal and vertical directions has optical action in the horizontal direction and optical action in the vertical direction different from each other.

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3. (Amended) The stereoscopic image display method according to Claim 1, wherein said second optical system forms images of pixels of said image display element on said mask member in the vertical direction and a position of a focal point [thereof] of said second optical system is approximately coincident with a position of the mask member in the horizontal direction.

5. (Amended) The stereoscopic image display method according to Claim 4, wherein said first optical system and second optical system have predetermined periodic structure in the horizontal direction, and at least one of the second optical system [or/]and the image display element [are] is placed on [intersecting] planes defined by intersections of [many] straight lines connecting i) two adjacent view points out of the N view points arranged at the equal intervals in the horizontal direction and ii) a horizontal center of each elementary optical element forming the second optical system.

7. (Amended) The stereoscopic image display method according to Claim [1] 4, wherein intersecting points of [many] straight lines connecting i) two adjacent view points out of the N view points arranged at the equal intervals and ii) a horizontal center of each elementary optical element forming said second optical system [agree with] are common to at least one of a) horizontal centers of the respective elementary optical elements forming the second optical system [or/]and (agree with) b) horizontal centers of pixels forming the image display element.

8. (Amended) The stereoscopic image display method according to Claim 1, wherein the following relations are met:

$$Nd*HL1/E = Lhd/(Lhd + Lh0) \quad (h1)$$

$$Hd/HL1 = (Lh0 + Lhd)/Lh0 \quad (h2)$$

$$NL2*HL1/E = LhL2/(LhL2 + Lh0) \quad (h3)$$

$$HL2/HL1 = (Lh0 + LhL2)/Lh0 \quad (h4)$$

$$Hl/E = Lh1/(Lh1 + Lh0) \quad (h5)$$

$$Hl/HL1 = (Lh0 + Lh1)/Lh0 \quad (h6)$$

$$H1*Lh1a/Lh1 = HL1*Lh1b/Lh1 \quad (h7)$$

$$Lh1a + Lh1b = Lh1 \quad (h8)$$

$$Hm/H1 = Lh1a/Lh1 \quad (h9)$$

where N view points (N is an integer not less than 2) are arranged at equal intervals E on the observation surface the predetermined distance apart, HL1 is a horizontal period of elementary optical elements forming said first optical system, Hm a horizontal width of the openings of said mask member, HL2 a horizontal period of elementary optical elements forming said second optical system, Hd a horizontal pixel pitch of the image display element, LhL2 and Lhd an optical reduced distance between the first optical system and the second optical system and an optical reduced distance between the first optical system and the image display element, respectively, Lh0 an optical reduced distance from the observation surface to the first optical system, Lh1 an optical reduced distance from the first intersecting plane, when [counted] measured from the first optical system toward the

image display element, out of the intersecting planes of line groups connecting two adjacent view points out of the N view points and each pixel of the image display element, to the first optical system, Lh1a and Lh1b an optical reduced distance from the first optical system to the mask member and an optical reduced distance from the mask member to the first intersecting plane from the first optical system out of the intersecting planes, and Nd and NL2 integers not less than 2 (Nd > NL2).

13. (Amended) The stereoscopic image display method according to Claim 1, wherein said second optical system is comprised of a lenticular lens in which cylindrical lenses being [long] elongated in the vertical direction and having an optical power only in the horizontal direction are arranged at predetermined intervals in the horizontal direction and a lenticular lens in which cylindrical lenses being [long] elongated in the horizontal direction and having an optical power only in the vertical direction are arranged at predetermined intervals in the vertical direction.

15. (Amended) A stereoscopic image display method [with] using an image display element and a mask member having a mask pattern with predetermined openings and shields, said method comprising the steps of:

[wherein] directing [of] image display light from [said] the image display element; and

effecting the directing of the image display light with [is effected by] a first optical system and a second optical system placed before and after [said] the mask pattern, wherein the second optical system has predetermined periodic structure in each of horizontal and vertical directions in order from the light incident side, and an elementary optical element forming one period in the horizontal and vertical directions has optical action in the horizontal direction and optical action in the vertical direction different from each other.

16. (Amended) A stereoscopic image apparatus using the stereoscopic image display method as set forth in [either] any one of Claims 1 to 5 and 7 to 15.

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